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REMARKS/ARGUMENTS

Claims 9-36 are pending in this application. By this Amendment, Applicant amends claim 9 and adds claims 21-36.

Applicant appreciates the Examiner's indication that claim 11 would be allowable if rewritten in independent form including all of the features of the base claim and any intervening claims.

Applicant submitted Information Disclosure Statements on June 24, 2003 and May 4, 2004. In response to this Amendment, Applicant respectfully requests that the Examiner provide Applicant with initialed and signed copies of the PTO-1449 forms to acknowledge that the Information Disclosure Statements have been entered and considered.

Claims 9, 10 and 12-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Angona et al. (U.S. 4,649,525) in view of Sakamoto (U.S. 4,237,399) or Hayashi et al. (U.S. 5,233,256). Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Angona et al. in view of Sakamoto or Hayashi et al., and further in view of Huguenin et al. (U.S. 4,445,256) or Furbacher et al. (U.S. 5,831,369). Applicant notes that the rejection of claim 8 is clearly improper because claim 8 has previously been canceled. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 8. Applicant respectfully traverses the rejection of claims 9, 10 and 12-20.

Claim 9 has been amended to recite:

"A piezoelectric type electric acoustic converter comprising:
a plurality of piezoelectric ceramic layers which are laminated to define a laminate, all of the plurality of piezoelectric ceramic layers being polarized in the same direction which is a thickness direction of said laminate;
main surface electrodes disposed on front and back main surfaces of said laminate;
an internal electrode disposed between a respective pair of said polarized piezoelectric ceramic layers; and

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a resin layer arranged to cover the front and back surfaces of the laminate; wherein

said main surface electrodes, said internal electrode and said polarized piezoelectric ceramic layers are constructed and arranged to cause the piezoelectric type electric acoustic converter to generate bending vibration in response to application of an alternating signal between the main surface electrodes and the internal electrode; and

the resin layer is not disposed on side surfaces of the laminate." (emphasis added)

Claim 23 recites:

"A piezoelectric type electric acoustic converter comprising:

a plurality of piezoelectric ceramic layers which are laminated to define a laminate, all of the plurality of piezoelectric ceramic layers being polarized in the same direction which is a thickness direction of said laminate;

main surface electrodes disposed on front and back main surfaces of said laminate;

an internal electrode disposed between a respective pair of said polarized piezoelectric ceramic layers; and

a resin layer arranged to cover only the front and back surfaces of the laminate; wherein

said main surface electrodes, said internal electrode and said polarized piezoelectric ceramic layers are constructed and arranged to cause the piezoelectric type electric acoustic converter to generate bending vibration in response to application of an alternating signal between the main surface electrodes and the internal electrode."
(emphasis added)

With the unique combination and arrangement of elements recited in Applicant's claims 9 and 23, including the feature of "the resin layer is not disposed on side surfaces of the laminate" and "a resin layer arranged to cover only the front and back surfaces of the laminate," Applicant has been able to provide a diaphragm which obtains a large sound pressure while having a simple connection structure, and a piezoelectric type electric acoustic converter which has greatly improved shatter strength (see, for example, the first full paragraph on page 4 of the originally filed specification).

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The Examiner alleged that Angona et al. teaches a piezoelectric multi-layer laminated bender producing acoustic waves which includes a laminated body that is encapsulated in a potting compound made of resin. The Examiner acknowledged that Angona et al. fails to teach or suggest the poling-directions for the piezoelectric elements or a specific Young's modulus for the resin. The Examiner further alleged that Sakamoto and Hayashi et al. teach piezoelectric bimorph benders that are poled in the same direction, and that "it has long [been] held that optimization of a know device (e.g. thru routine experimentation) for a specific application is within the skill expected of the routineer." Thus, the Examiner concluded that "to select same direction poling and a specific [Young's] modulus for the coating would have been within the skill expected of the routineer."

Claim 9 has been amended to recite the feature of "the resin layer is not disposed on side surfaces of the laminate." Claim 23 recites the feature of "a resin layer arranged to cover only the front and back surfaces of the laminate." In contrast, as acknowledged by the Examiner, Angona et al. teaches that the laminate is encapsulated in a potting compound made of resin. In other words, the resin layer of Angona et al. is disposed on every surface of the laminated, including on the side surfaces of the laminate. Thus, Angona et al. clearly fails to teach or suggest the features of "the resin layer is not disposed on side surfaces of the laminate" as recited in Applicant's claim 9 and "a resin layer arranged to cover only the front and back surfaces of the laminate" as recited in Applicant's claim 23.

Sakamoto and Hayashi et al. were relied upon merely to teach benders that are poled in the same direction. However, neither Sakamoto nor Hayashi et al. teaches or suggests the features of "the resin layer is not disposed on side surfaces of the laminate" and "a resin layer arranged to cover only the front and back surfaces of the laminate" as recited in Applicant's claims 9 and 23, respectively. Thus, Applicant respectfully submits that Sakamoto and Hayashi et al. fail to cure the deficiencies of Angona et al. described above.

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Accordingly, Applicant respectfully submits that Angona et al., Sakamoto and Hayashi et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicant's claims 9 and 23.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 9, 10 and 12-20 under 35 U.S.C. § 103(a) as being unpatentable over Angona et al. in view of Sakamoto or Hayashi et al.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claims 9 and 23 are allowable. Claims 10-22 and 24-36 depend upon claims 9 and 23, respectively, and are therefore allowable for at least the reasons that claims 9 and 23 are allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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